

France, No.1 in Europe for Heat-Treated & Naturally Durable Hardwoods



Used as cladding, heat-treated oak turns a caramel colour (Photo by French Timber)

France is the European leader in heat-treated hardwoods. These new products have numerous advantages. French producers are now offering a rich and varied range of products for export. An accompanying range in naturally durable wood is also available.

Preserving wood through heat-treatment. This is not a new concept. The process is as old as history itself, having proved its worth over thousands of years. Yet nowadays, heat-treated wood - also known as thermally modified wood - is far from being a craft or small-scale product. Manufacture has become an industrial process, using highly developed, modern technology.

This is particularly the case in France, where heat-treated wood products are actively developed to meet a growing market demand.

The rich and diverse forests of France are filled with naturally durable resources. Like the black locust (false acacia) or the white oak, for example,

both with a natural risk level of 4 without any chemical treatment or other additives. This means that wood from these two species can be used in situations of extreme humidity.

Until now, where other French species needed to be used in frequently damp areas (such as patios, cladding, outdoor developments, play areas, garden furniture, etc.), chemical treatment of the wood by autoclave was required. Now, heat treatment of wood offers an environmentally friendly alternative to chemical products made from metallic salts (such as chrome or copper).

The Advantages of Heat-Treated Wood

Gilles Négrié knows a lot about thermally modified wood. He is one of the experts at the FCBA, the largest French wood research institute, and he explains that the heat treatment of wood results in a new material. "Some constituent elements like hemicelluloses decompose, lignin

molecules are fused together, and the crystalline structure of the cellulose is altered..."

How do these transformations affect the properties of the wood? The changes are universally acknowledged to be positive. The decay of the hemicelluloses reduces the hydrophilic properties of the wood, making it less likely to change shape and more durable as a result. In this way, heat-treated wood becomes more resistant to attack from fungi and other microorganisms. Insects are less attracted to the wood, as the heating process has considerably reduced its constituent odourants (terpenes).

Researchers have also pointed out that the formation of chemical bonds through the cross-linking of lignin leads to a hardening of the material. Other advantages that favour the use of heat-treated wood include reinforced impermeability, even colouring of the mass throughout, improved thermal insulation, extraction of resins, fixation of tannins, etc. And heat-treated wood is environmentally friendly, there are



From left to right - oak, poplar and ash as decking boards (Photo by French Timber)



Grooved decking boards (oak on the left, ash on the right) (Photo by French Timber)



Many uses for heat-treated woods in patios (Photo by French Timber)

no chemicals involved in production and waste can be recycled.

A Wide and Varied Range of Heat-Treated Wood on Offer

Users are clear about the advantages of

heat-treated wood. In France and across Europe, demand is constantly increasing. “We have been developing thermo-stabilised products for four years, and in the past two years there has been a real surge in the market: sales are increasing

every year”, confirms Mathieu Blanc, Sales Director for Sivalbp.

France is in an ideal position to meet this demand. French producers manufacture 25,000m³ of heat-treated wood annually. Within European market that only offers softwoods, France differs by offering a majority of heat-treated hardwoods, making it the leader in this market sector.

“Our range is large and varied”, says Louis Naudot, Manager of Dumoulin Bois, a company that has been producing a large selection of heat-treated woods for frames, woodwork, decking, cladding, posts, etc. from different sources (including oak, beech, ash, poplar and chestnut), for a number of years now. “Each species has its own characteristics; the aim is to offer a very wide variety of thermally modified woods to suit the greatest number of requirements.”

Heat-treated wood is also making waves in the world of furniture and interior design. It has become fashionable among French and European designers. Why? Because these designers, closely linked to the world of high fashion, appreciate a new material that offers a wide palette of colours, from grey to chocolate according to the treatment temperature. As with fashion design, novelty sells. This is why the designers’ collections now increasingly feature furniture made from ash, along with the classics like oak and beech.

Heat-Treated Poplar, a Certified and Hard-Wearing French Wood

What do end users think of heat-treated woods? René Bruger is one of them. He runs a company called Jardimat in eastern France, specialised in gates and enclosures. He had been looking to expand his range of wooden doors with a new hardwood that would be easy to work with and affordable. In the end it was an outsider that got the job, a species that doesn’t really spring to mind for outdoor use: poplar.

According to René Bruger, poplar is ideal. “This little-known wood needs to be rediscovered,” he declares. He says it is



*Grooved decking in natural oak
(Photo by French Timber)*

an aesthetic species, with a smooth grain, pleasant to the touch. “When heated, it becomes stable and durable, resistant to external forces, particularly humidity,” he says with satisfaction. After a variety of machining processes in the Jardimat workshops, these gates are protected with a Woodguard™ finish, free of solvents and chemicals and guaranteeing enhanced protection (against water, UV, ageing, and various external agents, for example).

The Ducerf group is one of the leading manufacturers and distributors of hardwoods in France. Their ‘Profiled Wood’ unit is one of the largest users of heat-treated wood in France. “Heat-treated woods are being used in an increasingly diverse range of situations including indoors, with the jointed glue-laminated panels and solid laminated panels that we produce.” Julien Guénard, the company’s Quality Manager, adds that Ducerf markets decking boards and cladding with specific machining profiles, according to their customers’ needs.

A Naturally Hard-Wearing Range of French Oak and Acacia

The black locust (or false acacia) and the oak are the two most naturally durable French hardwoods. They are classified at a risk level of 4 without the end user having to chemically treat or heat the wood. According

to French standard NF EN 335-2, woods in risk class 4 can be constantly exposed to a humidity level above 20%. “We offer decking in French-sourced natural oak, planks of wood without sapwood that can be used for outdoor developments, play areas, seafront promenades, platform edges, etc.” Éric Julien, Chief Executive of Eurochêne, confirms that it can also be used for the more conventional applications of patios and cladding.

The finished thickness of decking generally ranges from 22mm to 48mm of lengths between 1m and 4m, with three finished widths (100mm, 130mm and 170mm). Other dimensions can be ordered in a wide range of profiles and finishes (grooved, smooth, asymmetrical, mortise and tenon, etc.). Acacia is making important inroads into European markets. With a reputation for being even more resistant than oak, the wood can easily last for over 30 years in contact with soil and water. “We mostly sell it for patios, swimming pool decking, outdoor cladding...”

Aside from ecological benefits, these natural oak and acacia products are sold at competitive rates, as they are not subject to treatment or heating costs. Sourced from sustainably managed forests, these two French species also benefit from PEFC-certified traceability.



*Natural oak decking, Paris
(Photo by French Timber)*



Natural French Acacia used as cladding (Photo by French Timber)

Thermal Treatment of Wood: A Proven Technology

Sébastien Deschamps is a leading French specialist in heat-treated wood. He is the Director of Bois Durable de Bourgogne (Burgundy Sustainable Wood'), a company with three ovens for the thermal modification of wood. "In our company, we use a heating system called Thermoprocess. This technique from Finland, with the trademark ThermoWood, takes place in four distinct phases, with treatment lasting between 30 and 60 hours." In order to dry planks to 0 percent humidity, they first have to be subjected to a rapid increase in temperature, explains the technician. Thermal treatment of the wood then takes place during the second phase, with the air temperature reaching 220°C in the oven, over two hours.

This is where the internal modification

of the wood takes place. The temperature is then dropped, by a cooling process using water vapour and monitoring of temperatures right to the heart of the wood in order to avoid splitting. The last phase adjusts the final humidity of the wood using rehumidification, bringing the planks to a humidity level of 5 percent.

"We use Jartek ovens from Finland, each with a capacity of 20m³, and at no point do we use any chemical products." Sébastien Deschamps adds that Bois Durable de Bourgogne allocates a class risk category of 3 to seven different products: ash, beech, poplar, oak and Douglas fir with or without sapwood. Other species (spruce, pine) complete the company's range of cladding, decking, garden furniture, flooring and layouts.

"We are currently employing a scientist



Sébastien Deschamps, Technical Manager at Bois Durable de Bourgogne (Photo by French Timber)

in order to obtain the certification to sell our products as class 4, for exterior products constantly exposed to humidity," confirms the Technical Manager. The Fédération Nationale du Bois (French National Wood Federation) has asked the FCBA for an assessment in order to certify oak, beech, ash, poplar and chestnut cladding and decking as class 4.

Ash, a fashionable heat-treated wood (Photo by French Timber)

